DMS-8241, Prefabricated Pavement Markings – Removable

Overview

(Formerly D-9-8241, Prefabricated Pavement Markings – Removable).

Effective Date: August 1998 – May 2003.

This specification shall govern for the materials, composition, quality, sampling, and testing of prefabricated pavement markings-removable.

Bidders' and/or Suppliers' Requirements

All prospective bidders and/or suppliers are notified that, before any material is considered, it shall be of manufacture and product code or designation shown on the list of approved manufacturers of materials covered by this specification and maintained by the General Services Division (GSD) of TxDOT.

Payment

Payment for all materials governed by this specification will be in accordance with the provisions of the purchase order or contract awarded by the State.

Prequalification and Performance History

Establishment of Performance History

Prospective bidders and/or suppliers who desire to prequalify and establish a performance history for their product governed by this specification, should contact the Texas Department of Transportation, General Services Division, 125 East 11th Street, Austin, TX 78701-2483.

Prospective bidders and/or suppliers will be notified, after their material has been evaluated, as to conformance with the requirements of this specification.

In addition to requirements stipulated elsewhere in this specification all material seeking prequalified status shall be submitted to and pass the following road test prior to being placed on the list of prequalified materials maintained by GSD.

- Road tests shall be at locations selected by TxDOT within 80 kilometers (50 miles) of Austin, Texas.
- Locations may be in either straight or curved sections of roadways.
- Material shall be placed on the roadway as both longitudinal and transverse markings.

Each potential supplier shall submit, at no cost to TxDOT, a minimum of 46 meters (150 feet) of white 102 millimeter (four [4] inch) wide markings and 15 meters (50 feet) of yellow 102 millimeter (four [4] inch) wide markings for the road and other prequalification tests.

- Transverse Markings
  - Three transverse markings at each location shall be 3.0 to 3.6 meters (10 to 12 feet) in length and placed approximately 102 millimeters (four [4] inches) apart.
- Longitudinal Markings
  - Three longitudinal markings, approximately 102 millimeters (four [4] inches) apart, shall be 3.0 to 3.6 meters (10 to 12 feet) in length and placed in each wheel path upstream to traffic and in the same traffic lane as the transverse markings.
- Test Locations
  - Test locations shall not be within 91 meters (300 feet) of an intersection or other location where traffic may be required to stop by a traffic control device installed on the roadway.
- Road Conditions
  - Markings may be placed on either asphaltic or concrete pavements.
  - Average minimum daily traffic (ADT) per lane shall be 15,000.
  - No distinction shall be made between truck and car traffic.
- Results
  - Markings must remain in place, serviceable, distinctly reflective and removable in pieces no less than 0.6 meters (two [2] feet) in length at temperatures above 4 °C (40 °F) without the use of heat, solvents, grinding, or blasting after passage of 1,200,000 vehicles (time on roadway shall be prorated based on latest available ADT).
  - Inspection and evaluation of results will be performed at the end of the roadway test.

Performance History

Some of the tests required by this specification extend over a prolonged period of time. Therefore, testing for acceptance of materials supplied on any state purchase order will only be considered on those materials which are determined by CST/M&P, to be identifiable as a material having an established performance history of compliance with the criteria established by this specification.

Re-evaluation

When, in the opinion of the Director of CST/M&P, changes have been made in the composition and/or manufacturing process of a prequalified material, a re-evaluation of the performance may be required.

TxDOT may conduct additional tests to identify changes in the material. Changes that are detected in composition and/or manufacturing process, which have not been reported by the manufacturer, may be cause for removal of that material from the list of prequalified material.

Periodic Evaluation

TxDOT reserves the right to periodically evaluate the performance of materials.

Samples for periodic evaluation of performance will be selected at random from materials submitted to TxDOT on state purchase orders.

Failure of materials to comply with the requirements of this specification as a result of periodic evaluation, may be cause for removal of those materials from the list of prequalified materials.

Sampling and Testing

Sampling and testing shall be in accordance with CST/M&P *Manual of Testing Procedures.*

Material Requirements

General Requirements

The prefabricated pavement marking-removable film shall be designed in a manner to facilitate easy removal from the roadway.

Glass beads shall be incorporated into the film in such manner that bead retention and reflective characteristics stipulated elsewhere in this specification are complied with.

Materials utilized in the manufacture of and the construction of the film shall be at the discretion of the manufacturer provided however, that the materials and construction remain the same as those utilized in the prequalifying sample.

The back of the marking film shall be precoated with a pressure-sensitive adhesive suitable for affixing the markings to asphaltic or concrete pavements.

The adhesive shall not require heat, solvents, or any other means to activate adhesion of the material to roadway surfaces.

Dimensional Tolerance

The material shall be supplied in the width, shape or shapes, as specified and meet the following requirements:

- All lengths and widths of shapes shall be within three (3) millimeters (1/8 inch) of those specified.

- Width of roll material shall be within three (3) millimeters (1/8 inch) of that specified.
- Thickness without adhesive shall not vary over minus 10 percent nor plus 25 percent of the average thickness determined on the prequalifying sample.

Color

The color of the pavement marking material, as specified, shall appear uniform and its CIE Chromaticity Coordinates, when determined in accordance with Test Method "Tex-839-B, Determining Color in Reflective Materials," shall fall within an area having the following corner points and shall meet the following brightness requirements:

CIE Chromaticity Coordinate Corner Points and Brightness Requirements

	1		2		3		4		Brightness
	x	y	x	y	x	y	x	y	Y
White	.290	.315	.310	.295	.350	.340	.330	.360	Min. 65
Yellow	.470	.455	.510	.489	.490	.432	.537	.462	45-60

NOTE*:* The white and yellow pavement marking materials shall meet the above specified color requirements, for each color respectively, before and after 70 hours of exposure in a Weather-Ometer (Atlas, Sunshine Type) fitted with an 18-102 (18 minutes of sunshine and rain, and 102 minutes of sunshine) cyclic gear. Panels for testing shall be prepared with pavement marking materials as supplied to the destination of goods address. Accelerated Weathering shall be in accordance with Test Method "Tex-801-B, Testing Coatings and Related Material."

Resistance to Environmental Conditions

- Moisture
  - The material, applied to a clean aluminum panel in accordance with the manufacturer's instructions, allowed to cure for 24 hours at 16 to 27 °C (60 to 80 °F), and then submerged in water for four hours and allowed to dry, shall show no deterioration, change in color, loss of reflectivity, nor loss of adhesion.
- Chemicals
  - Contact between the pavement marking material and calcium chloride or sodium chloride shall not cause deterioration, change in color, nor loss of retroreflectivity of the material; nor shall it be deteriorated by oil droppings from traffic.
- Temperature
  - The pavement marking material shall retain its shape and integrity at all pavement temperatures between -18 to 71 °C (0 and 160 °F).
  - Pavement temperature will be determined in accordance with Test Method "Tex-829-B, Measuring Pavement Temperature."
- Bead Adhesion

- When tested according to Test Method "Tex-852-B, Determining Bead Adhesion of Pavement Marking Material," the rating shall be excellent after 200 cycles.

♦ Retroreflectivity

- The specific intensity (S.I.) of the pavement markings shall be as shown in the following table.
- The brightness values shall be determined at an 86 degree entrance angle and observation angle as shown.
- Brightness values (S.I.) shall be expressed in units of lumens per lux per square meter (candlepower per foot-candle per square foot).

Brightness Values			
Observation Angle		**Specific Intensity**	
		1m/1x/m^2	**(cp/ftc/ft^2)**
White	0.2°	1.63	(0.13)
	0.5°	1.26	(0.10)
Yellow	0.2°	1.26	(0.10)
	0.5°	0.75	(0.06)

- Specific intensity will be determined in accordance with Test Method "Tex-842-B, Measuring Retroreflectivity."

♦ Chemical Analysis

- The infrared and x-ray analysis of the face side of the markings shall match those of the prequalified material.
- The infrared analysis of the adhesive shall match that of the prequalified material (test methods "Tex-888-B, Obtaining the Infrared Spectrum of Organic Materials" and "Tex-896-B, Qualitative and Semi-Quantitative Analysis of Crystalline Material by X-ray Diffraction").

♦ Storage

- The material shall meet the criteria of this specification after being stored in a cool, dry indoor area for a period of one year.